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than the system. As *The Popular Science Monthly* says: "In a great university, such as Harvard, courtesy and consideration do not fail. In the smaller colleges, there is the spirit of the family. So long as the best men are found at our colleges and universities, it may not matter greatly under what system of academic government they live. But there is real danger that the existing system may prove repulsive to men of the highest intelligence and character, and that mediocrity and time-serving may be developed, where we need the most vigorous ability and independence." It was the older American idea that the president of a college was simply *primus inter pares*. To-day there is as wide a gulf between him and his faculty as between a superintendent of city schools and the grade teachers, and however the change may better business management, it does not attract strong men to the profession of teaching, nor does it foster a vigorous intellectual life in the universities. And occasionally a gross and tyrannical abuse of authority reminds the world how far America is behind Germany in the freedom of its university life.—*Springfield Republican*.

#### SCIENTIFIC BOOKS

*The Labyrinth of Animals.* By ALBERT A. GRAY. Vol. II. London, J. A. Churchill. 1908.

The first volume of Dr. Gray's extensive stereo-photographic studies of the vertebrate labyrinth has been reviewed in SCIENCE.

The second volume is fully up to the standard of the first volume, and is a storehouse of interesting and valuable information. The author, in a prefatory note to Vol. II., states that he is indebted to the Carnegie Trust for their liberal generosity in assisting him in the publication of this volume. We think the volume well worthy the support.

As in the first volume there is a series of stereoscopic photographs, giving magnified views of the labyrinths of the various animals studied. Brief descriptions and summaries accompany these photographs.

The volume begins with the continuation of

the study of the rodent labyrinth. The labyrinth of the capybara is interesting, in that it presents the most extreme example of the sharp-pointed type of cochlea yet described.

The labyrinth of the insectivora is next considered. "This organ shows evidence of more ancient characteristics than that of any other order of mammals with the exceptions of the monotremata, sirenia, cetacea and a few of the polyprotodont marsupials."

In the labyrinth of the cetacea and sirenia, the cochlea is of a "very primitive type." The appearance of the labyrinth lends little support to the view that the sirenia and cetacea are closely related to the ungulates or to the edentata. The ankylosis of the cervical vertebrae, which is so marked a feature in the anatomy of the cetacea, and the consequent limited movement of the head upon the trunk, are associated with marked modifications in the vestibules and canals. The semicircular canal portion of the labyrinth is very small as compared with the cochlear portion.

The marsupialian labyrinth is next considered. "While there is no doubt that the marsupials left the main stem of mammalian descent at a much earlier period than most of the orders, yet, so far as the labyrinth is concerned, they have developed along parallel lines to such an extent that the organ must be considered almost as far advanced as in some of these orders."

The only example of the monotreme labyrinth studied by Dr. Gray is that of the duck-billed platypus. "In appearance it may be said to stand midway between the labyrinth of the reptiles and that of the eutherian mammals."

The study of the labyrinth of mammals is concluded by a brief study of the venous system of the labyrinth.

The labyrinth of birds is next taken up. The comparative anatomy of the avian labyrinth has been less studied than that of other divisions of the vertebrates. Thus Gray's contributions to the subject are of special value. The labyrinth of birds bears resemblances to that of the alligator on the one hand and that of the monotremes on the other.

In general, in birds the vestibule is very small, while in reptiles it is the largest part of the labyrinth. In some respects the canals in the avian labyrinth show greater resemblance to those in the mammalian labyrinth than to those in the majority of reptiles.

The book is concluded by a brief description of the labyrinths of reptiles and amphibia. Dr. Gray points out that the typical reptilian labyrinth of the present time is by no means so similar to that of birds, as many anatomists seem to think. The labyrinth of the alligator is very different from the typical reptilian organ. In reptiles the cochlea is relatively small, and is drawn out in the form of a cone, except in the teguixin and the alligator, where it has more of a tube shape. The vestibule is the bulkiest portion of the labyrinth, and contains a well-developed otolith apparatus. The canals are distinguished from those of birds, mammals and amphibians by their angularity and comparative straightness of outline. The horizontal canal, however, has a curved outline as in other divisions of the vertebrates. The canals are not set in planes at right angles to one another, but are frequently in planes which are parallel to one another, or at angles of forty-five degrees. This is of importance in view of theories which have been advanced as to the functions of the canals.

The description of the labyrinth of the amphibians is limited to two examples, both belonging to the anura. The author states that since the organ varies considerably in different species a much larger amount of material would be required to give an even fairly complete description of the labyrinth of the amphibians. The descriptions given of the labyrinths of the giant toad and the tigrine frog are interesting for the sake of comparison with those of higher forms.

As in the preceding volume, very valuable tables of measurements of the various labyrinths studied are given.

Dr. Gray is to be congratulated upon the important contribution which he has made to this valuable field of comparative anatomy.

C. R. B.

*A Text-Book of Physiological Chemistry.*

By OLOF HAMMARSTEN. Translation from the Sixth German Edition, by JOHN A. MANDEL. Fifth Edition. New York, John Wiley and Sons. 1908. Pp. 845.

Professor Hammarsten's "Physiological Chemistry" continues, in its successive editions, to rank as the most successful and reliable of the current text-books, if it is not also the most popular among them. One gains a good impression of the rapid advances which chemical physiology has experienced in recent years by comparing the first German edition of 1890—a book of 400 pages—with the present translation of its latest successor. Familiar defects of text-books on progressive "laboratory sciences" have consisted in the failure to keep abreast of the advances in knowledge and in the tendency to present the subject—physiology in particular—in a cut-and-dried, dogmatic fashion. One can only admire the industry of Professor Hammarsten in maintaining a thoroughly up-to-date record. In contrast with several of the American and German books in the same field, his volume shows both range and perspective in a degree which is attributable to the author's long experience and broad scholarship. But in addition to all this, the treatment is peculiarly *suggestive*, so that the reading of any chapter will bring to even the younger student some appreciation of the present evolutionary stage of physiological chemistry and of the problems which present themselves on all sides. A review of scientific evidence may not furnish an ideal compendium for "preparing for examinations." It is, however, eminently superior to a dogmatic text in affording an appreciation of the way in which physiology develops.

The successive editions of Hammarsten's book seem to the reviewer to embody a gradually improved critique in the elimination of accumulated data of uncertain value. Furthermore, it is encouraging to find in a foreign compilation some adequate recognition for the work of American biochemical investigators.

Hammarsten's text-book can not be said to